

Work Order ID 69105



Page 1

Monday, May 02, 2011 11:01:26 AM

Item ID: D350-748-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00

Customer:

Reference:

Run Start



Approvals: Process Plan: *N*

Date: *11-06-2*

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D350-748-141	F

100 0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-101

CHG002

8 11/07/15

CK for BGR 11/07/15

110 0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

SAD

11-06-28

120 0.00



QC15- Crosstube Dimensional Check

QC

Memo

0.00

Quality Control

GP 11.06.29

Pb-7

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.07.12	141	- Deflect tube to 3500lbs for 1 minute - Remeasure height and width	B	11.07.12	1	AP 11.07.12 DS/042	B 11.07.12
11.07.12	142	- NDT tube	L 11/7/12			AP 11.07.12 DS/042	B 11.07.12

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
11.06.24	110	One side bent high, over tolerance	AP 11.06.24 DS/042	Trim cuff 0.188" Acceptable	SAD 11-06-20	S 11/06/12	AP 11.06.24 DS/042	S 11/06/12

NOTE: Date & initial all entries

Work Order ID 69105

Monday, May 02, 2011 11:01:26 AM

Page 2

Item ID: D350-748-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00

Customer:

Reference:

Run Start

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

125

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Stress relief

Heat treat crosstube as per QSI010 4.3

Temp: 376Start time: 5h41Finish time: 9h41

SAD 11-06-28

127

0.00



QC

QC6- Inspect dimensions to drawing

Memo

0.00

Quality Control

Suldel29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 69105

Monday, May 02, 2011 11:01:26 AM

Page 3

Item ID: D350-748-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130



Crosstubes

Crosstubes

0.00

Memo

0.00

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

3-Engrave Part # and Batch # as per Dwg D350-748-141

4-Remove all marks from tube within limits of D350-748-141

5- Apply a light coat of LPS3 on the interior of tube
Batch: 109456

JW 11-06-28

Pho →

140



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00


CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)

5 holes

70

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-742-101 PAR #: _____ Fault Category: LANDING GEAR NCR: (Yes) No DQA: dk Date: 11/07/19
 Resolution: AS IS Disposition: AS IS QA: N/C Closed: / Date: 11-07-20

NCR: 69105		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
11/06/19	#130	7-tube was Drilled before stress relief was Done 2C new procedure wasn't recognized in w/o LOA	if 11.07.19 BS1042	have stress relief performed after drilling Acceptable this one time only	 11-10-19	S 11/07/19	CP 11.07.19 BS1042	S 11/06/19

NOTE: Date & initial all entries

Work Order ID 69105

Monday, May 02, 2011 11:01:26 AM



Page 4

Item ID: D350-748-101

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

150

Outsource process-Cadplate per QSI017 4.1.9.1

0.00



Outsource3

Memo

0.00

Outsource process - Cad plate

Issue P/O: 14394

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possible Supplier: Southwest United Industries

Ensure Certificate of Conformity is attached

CY 11/06/30 (2)

160

Receive & Inspect for Damage & Mat'l Certs

0.00



Packaging

Memo

0.00

Packaging

Ensure certificate of conformity is attached

Supp 11/17/10 (2)

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

11 07 15 (1)
PRO

[Signature]

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
		- NDT P/O: 14488 accen/med. - cycle test - NDT	CL	11/07/15	①		

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 69105

Monday, May 02, 2011 11:01:27 AM

Page 5

Item ID: D350-748-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

180

0.00



SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside crosstube as per QSI 005 4.2

2-Prime Outside of Tube as per Dart QSI 005 4.2

190

0.00



QC14- Inspect Spray Paint

QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

200

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Install Ground wire Insert, then insert screw and washer

2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035.

3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

11 07 14 (1)

8T 11-07-15

8T 11-07-15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 69105

Monday, May 02, 2011 11:01:27 AM

Page 6

Item ID: D350-748-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00

Customer:

Reference:

Run Start

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

11 07 15 (1)

220

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

u/b/15

230

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

8 u/b/15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 69105

Monday, May 02, 2011 11:01:27 AM

Page 7

Item ID: D350-748-101

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 5/16/2011 Req'd Qty: 1.00

Customer:

Reference:

Run Start

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

240

0.00



Packaging

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D350-748-101

Location: _____

PPP Rev: _____

250

0.00



QC

QC21- Final Inspection - Work Order Release

Memo

0.00

Quality Control

11/7/15

CK 11/07/15

MF

11-07-15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Page 1

Monday, May 02, 2011 11:01:33 AM

Work Order ID: 69105

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd




Start Date: 5/2/2011

Required Date: 5/16/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 06-07-05 JLM
 IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev:C Rev B 07-11-15 DD
 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D350-748-141TRN  Crosstube Turning Detail		Manufactured	No			110	Each	1.0000	1	1		11-06-24	
<div> <div>Location</div> <div>Loc Qty</div> <div>Loc Code</div> </div>													
<div> <div>LG046</div> <div>1</div> <div></div> </div>													
<div> <div>64475</div> <div>1</div> <div></div> </div>													
ALS4-1032-225  Insert		Purchased	No			200	Each	1,069.000	1	1		11-07-15	
<div> <div>Location</div> <div>Loc Qty</div> <div>Loc Code</div> </div>													
<div> <div>FP-B</div> <div>28</div> <div></div> </div>													
<div> <div>110768</div> <div>28</div> <div></div> </div>													
<div> <div>ST282</div> <div>1041</div> <div></div> </div>													
<div> <div>110768</div> <div>1041</div> <div></div> </div>													
AN960JD10  Washer	NAS1149D0363J	Purchased	No			200	Each	0.0000	1	1		11-07-15	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Monday, May 02, 2011 11:01:33 AM

Work Order ID: 69105

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011

Required Date: 5/16/2011

Start Qty: 1.00


Required Qty: 1.00

D2856-400 Manufactured No 200 f 215.2696 1.181 1.243158

 Abraison Strip 85 11-07-15


Location	Loc Qty	Loc Code
ST403	214.6	
68076	214.6	
ST409	0.6696	
63735	0.6696	

x1.181


D3502-1 Manufactured No 200 Each 31.0000 2 2

 Support 85 11-07-15

Location	Loc Qty	Loc Code
ST063	31	
61206	12	
61843	9	
64004	10	

x2

MS21920-20 Purchased No 200 Each 72.0000 2 2

 Clamp (per MIL-DTL-8783C) 117968 85 11-07-15

Location	Loc Qty	Loc Code
LG050	72	
116799	22	
117279	50	

MS27039-1-10 Purchased No 200 Each 217.0000 1 1

 Screw 85 11-07-15

Location	Loc Qty	Loc Code
ST290	150	
117441	150	
ST291	67	
115935	67	

xc

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Monday, May 02, 2011 11:01:33 AM

Work Order ID: 69105

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011

Required Date: 5/16/2011

Start Qty: 1.00

Required Qty: 1.00

AN4-41A
Bolt

Purchased No

220 Each

198.0000 8

Location

Loc Qty

Loc Code

ST360

198

115108

98

115705

50

116191

50

AN4-6A
Bolt

Purchased No

220 Each

1,162.000 16

Location

Loc Qty

Loc Code

ST356

962

115936

159

116191

3

116400

400

116924

400

ST358

200

117514

200

AN5-32A
Bolt

Purchased No

220 Each

159.0000 4

Location

Loc Qty

Loc Code

ST340

159

115589

59

117161

50

117514

50

AN960JD416
Washer

NAS1149D0463J

Purchased No

220 Each

0.0000 32 32

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Monday, May 02, 2011 11:01:34 AM

Work Order ID: 69105

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011

Required Date: 5/16/2011

Start Qty: 1.00

Required Qty: 1.00

AN960JD516 NAS1149D0563J Purchased No

220 Each

0.0000

8

8



Washer

D3500-1

Manufactured No

220 Each

44.0000

4

4



Saddle

Location

Loc Qty

Loc Code

ST424

9

66127

9

ST424/25

20

62207

20

ST425

15

61838

15

D3501-1

Manufactured No

220 Each

67.0000

16

16



Bushing

Location

Loc Qty

Loc Code

ST063

67

61984

67

MS21042L4

Purchased No

220 Each

4,748.000

24

24



Nut

Location

Loc Qty

Loc Code

ST300

4748

116823

1748

117441

3000

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Page 5

Monday, May 02, 2011 11:01:34 AM

Work Order ID: 69105

Parent Item: D350-748-101

Parent Item Name: Crosstube Installation, High Fwd

Start Date: 5/2/2011

Required Date: 5/16/2011

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

220

Each

1,171.000

4

4



Nut



ihlisp

Location

Loc Qty

Loc Code

ST300

1171

116105

411

116548

260

117441

500

4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

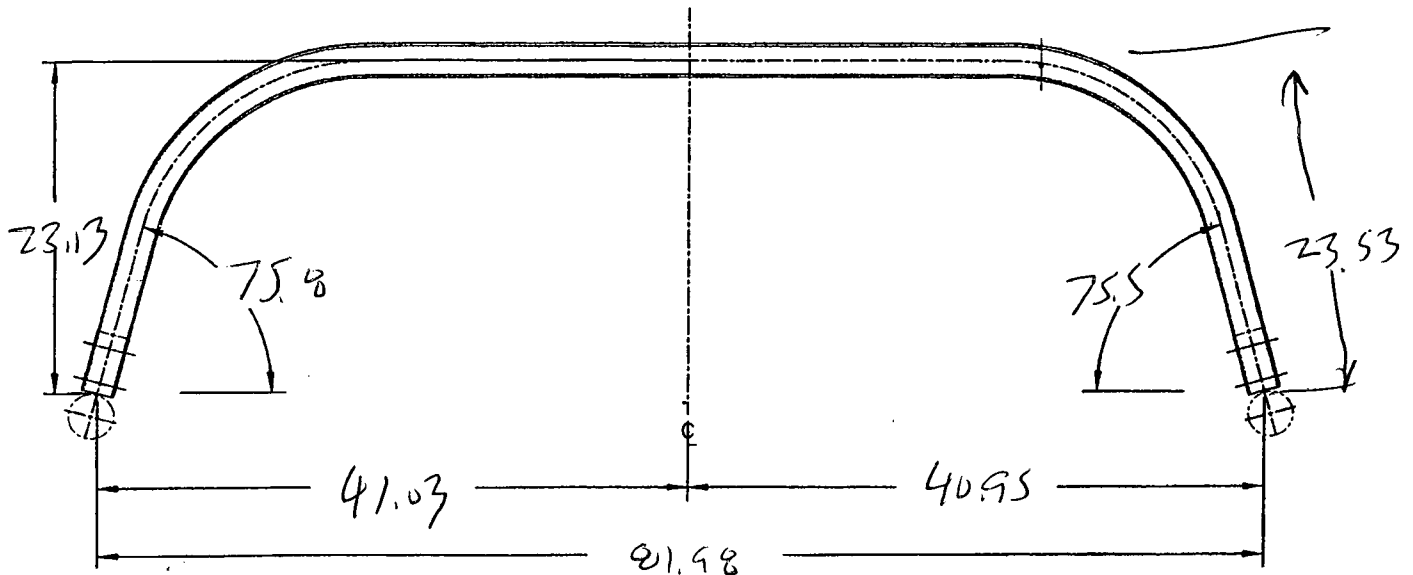
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	69105
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: E		Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
Tube bent high. Remove 0.188" from high side.
P 11.06.24

QC15 Inspection	P 11.06.24
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	

11.06.23

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

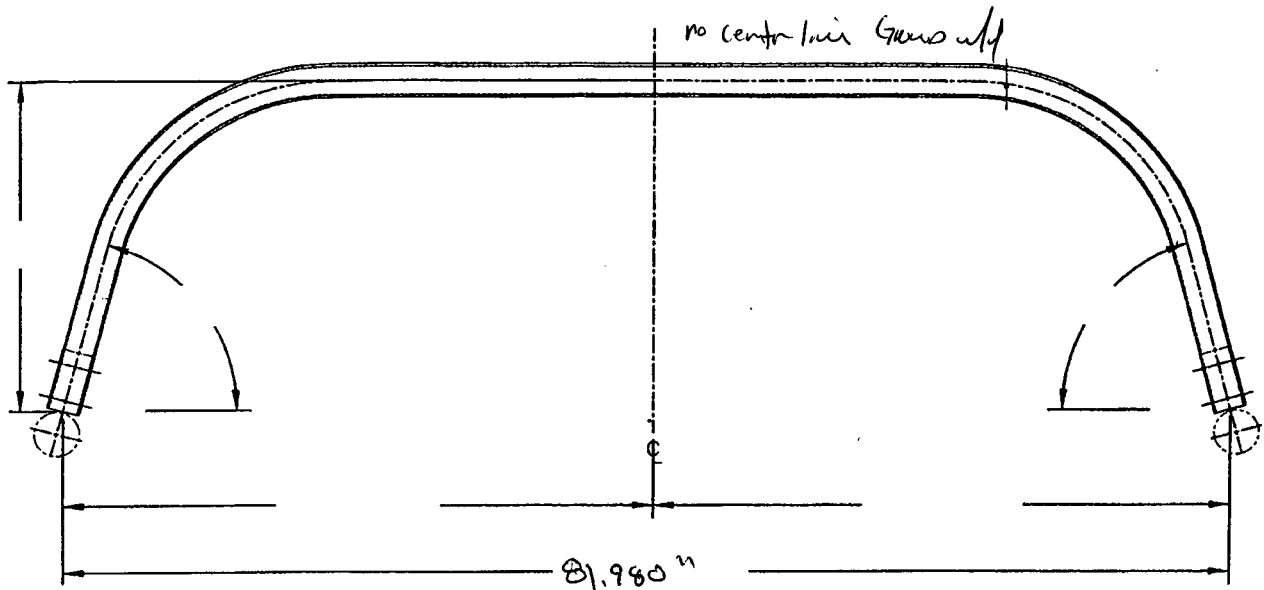
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	69105
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: E		Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
After stress Relief
twist 0.217"

QC15 Inspection	S
Date	11/06/23

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	

[Signature] 11/06/23

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 69105

11-09-2

RELEASED
R 2011-01-18 D

F	ADD HRC TEST OPTION (B8-1) PER PAR 08-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-141	REV. F SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE NTS
COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CO-OWNERSHIP THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR TRANSMITTED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

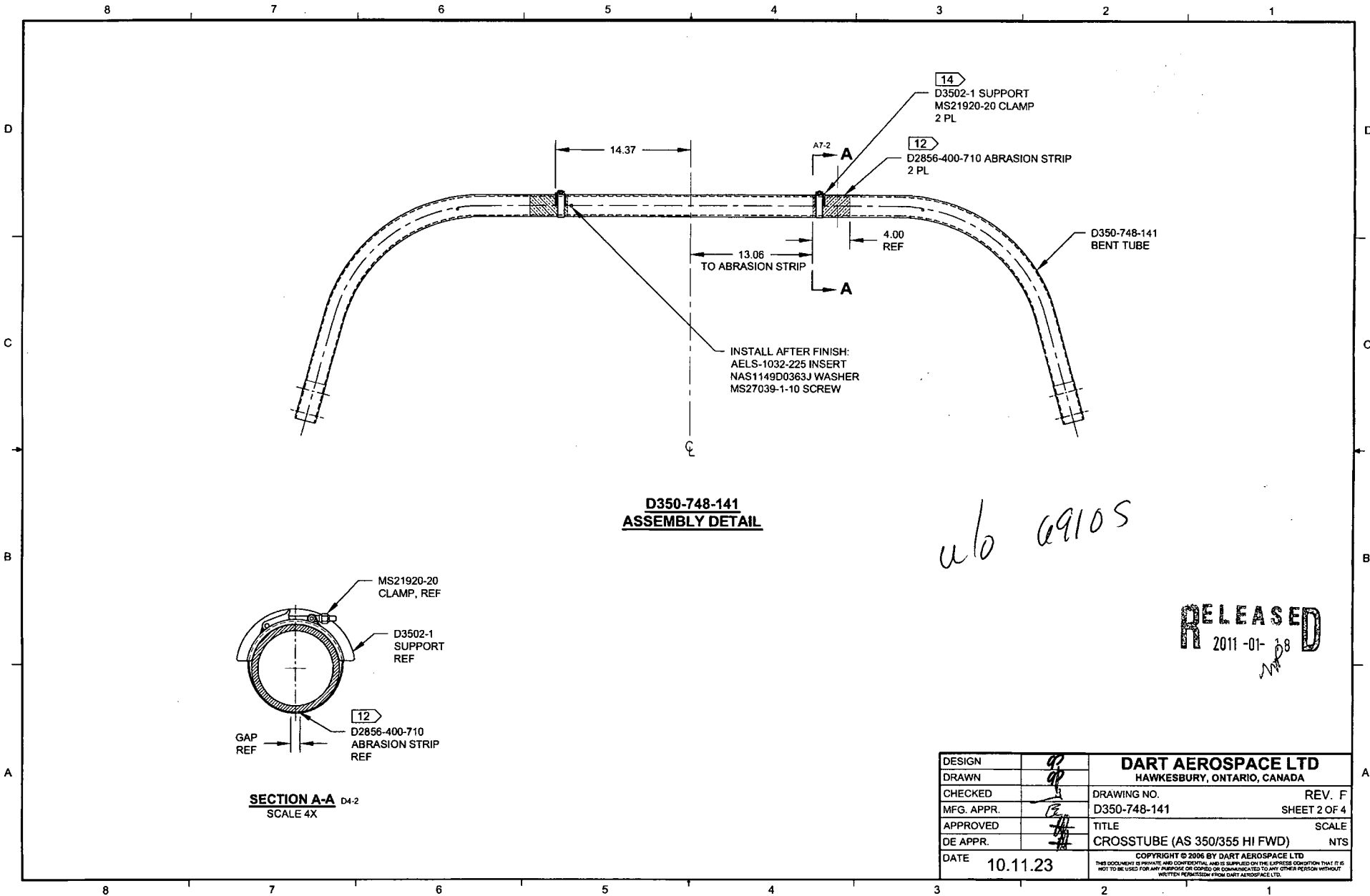
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



u/b 69105

RELEASED
2011-01-38

DESIGN	97	DART AEROSPACE LTD	
DRAWN	97	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. F
MFG. APPR.	97	D350-748-141	SHEET 2 OF 4
APPROVED	97	TITLE	SCALE
DE APPR.	97	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC-Inspector

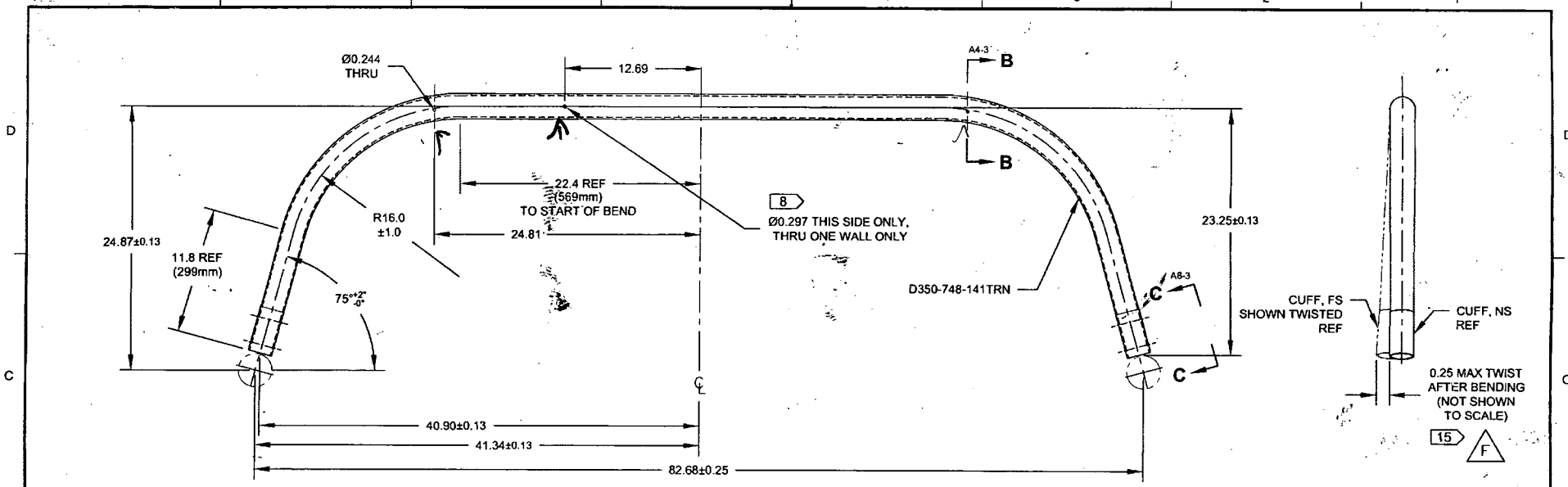
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

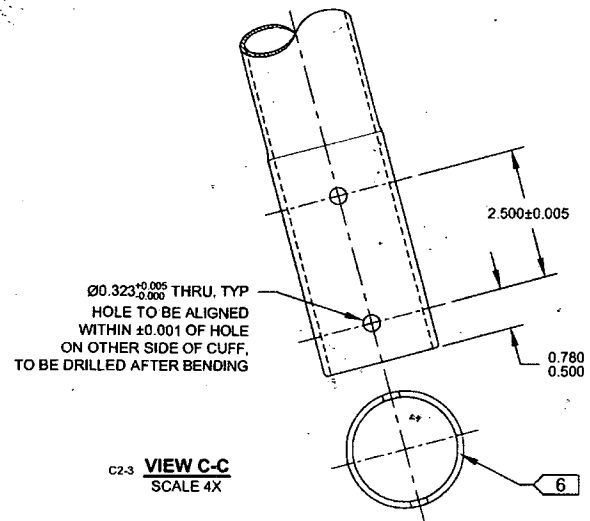
NOTE: Date & initial all entries

8 7 6 5 4 3 2 1

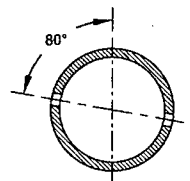


D350-748-141
BENDING AND DRILLING DETAIL 10

u/c 60105



VIEW C-C
SCALE 4X



SECTION B-B D3-3
SCALE 4X

RELEASED
R 2011-01-18

DESIGN	<i>9P</i>	DART AEROSPACE LTD	
DRAWN	<i>9P</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>3</i>	DRAWING NO. D350-748-141	REV. F
MFG. APPR.	<i>3</i>		SHEET 3 OF 4
APPROVED	<i>3</i>	TITLE	SCALE
DE APPR.	<i>3</i>	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

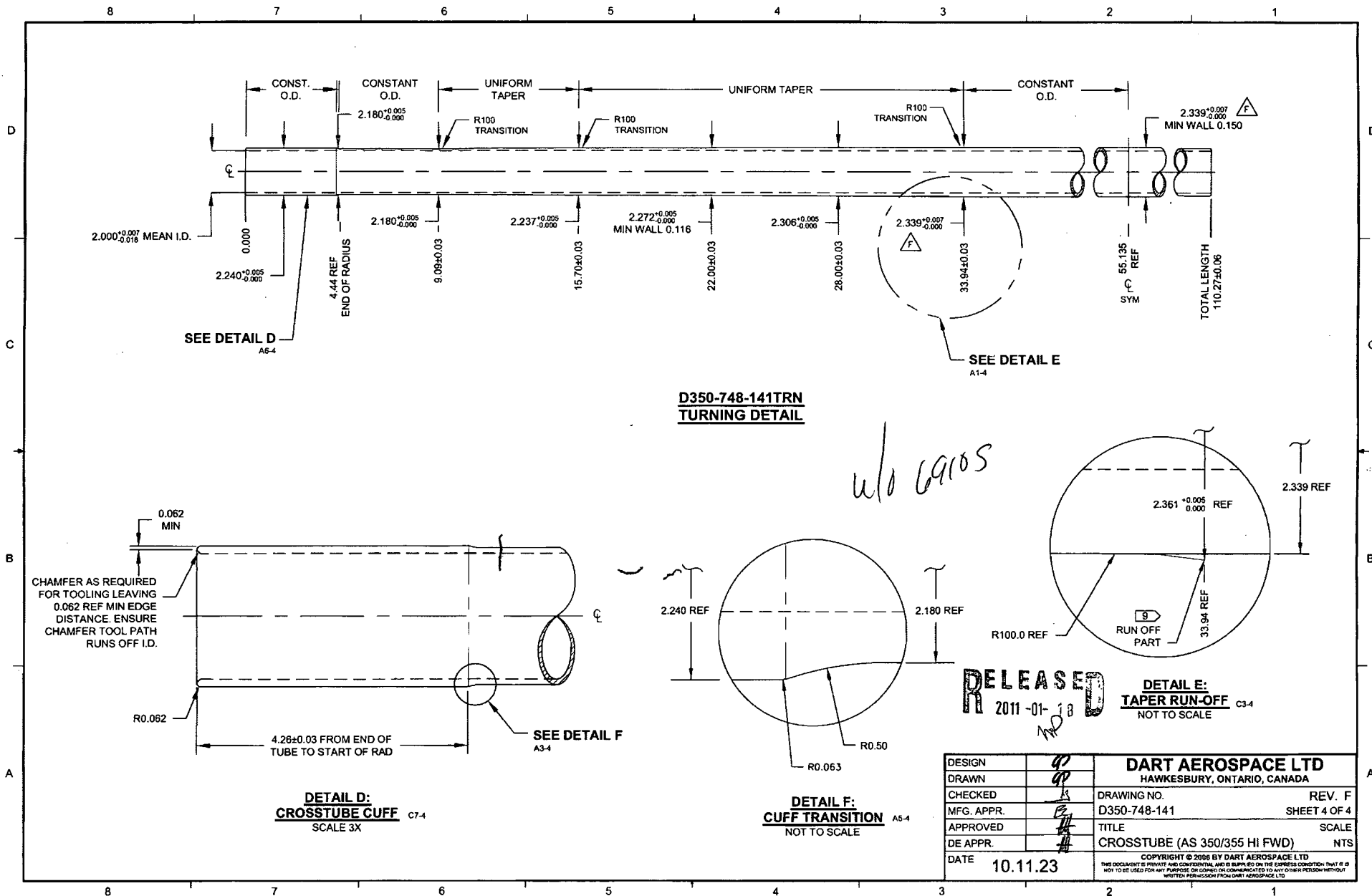
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

5.0 PARTS LIST

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE

• COPYRIGHT © 2006 BY DART AEROSPACE LTD •

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Revision: **B**

Date: 07.06.15

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jul-07-2011

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 105861
INVOICE #: 55672

**CONTRACT OR
PURCHASE ORDER # PO14394**

DESCRIPTION: SKID

QTY 3

P/N # d350-748-101

S/N #

STRESS RELIEF @ 375 DEG. FOR 5 HRS. BAKE HEAT CHART #11-698. MPI INSPECTED IAW ASTM-E-1444. CADMIUM PLATED IAW AMS-QQ-P-416C, TYPE 2 YELLOW, CLASS 2. BAKE HEAT CHART #11-707.

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.

Approved Inspector:





RAPPORT D'INSPECTION PAR RESSUAGE

P- 12376

PAGE 1 DE 1

CLIENT: Dant Aerospace
ATTENTION: Linda Macelle
ADRESSE: 1270 ABERDEEN
Hawkesbury, ONT
PROJET: FPI ON CROSS TUBES AND SLEEVES
ITEM(S) EXAMINÉ: SLEEVES
DATE: 14-7-2011
N° TRAVAIL: 188-11-02320
ACUREN
N° CLIENT PO/WO: 14488
SITE DE TRAVAIL: Hawkesbury Plant
ACCEPTATION STD.: ASTM 1417
HEURE: AM PM
DATE/RÉV.: 2005

DESCRIPTION DES TRAVAUX: N° PROCÉDURE: LT-6002 DATE/RÉV.: 2008 N° TECHNIQUE: LT-TECH 002 DATE/RÉV.: 2008

N° ITEMS: MATÉRIEL: Aluminium ÉPAISSEUR: Various
DESCRIPTION: A wet Fluorescent liquid penetrant examination was completed 100% external.

DÉTAILS DES INSPECTIONS

MÉTHODE: ☒ FLUORESCENT ☐ VISIBLE ☒ LAVABLE À L'EAU ☐ MÉTHODE DISSOLVANT ☐ PRÉ-ÉMULSIONNANT
MARQUE: Magan Flux LUM. NOIRE S/N 1878 ☐ PUISS. > 1 000 µ W/cm² ☒ AMBIANT < 2 fc
PÉNÉTRANT: 2267 TEMPS PÉNÉTRATION MIN. 10 45 MIN. ÉQUIP. LUMIÈRE ☐ LAMP. POCHÉ ☒ LAMP. CULASSE ☐ PUISS. > 100 fc @ SURFACE
DISSOLVANT PÉNÉTRANT: H2O TEMPS SÉCHAGE MIN. > 10 MIN. AUTRES:
RÉVÉLATEUR: SKD 52 TEMPS RÉVÉLATION MIN. 10 MIN. MÈTRE LUM. N/S 00525 DATE CAL DUE 15 oct 2011
TYPE RÉVÉLATEUR: ☒ NON AQUEUX ☐ AQUEUX ☐ SEC

SURFACE INSPECTÉE

CONDITION SURFACE: ☐ MEULÉE ☐ SOUDÉE ☒ MACHINÉE ☐ MRENAILLÉE ☐ MÉTAL PROPRE
TEMPÉRATURE SURFACE: ☐ < - 4°C/20°F ☐ - 4°C/20°F À 10° C/50°F ☒ 10°C/50°F À 52°C/125°F ☐ > 52°C/125°F

RÉSULTATS (☐ MÉTRIQUE ☐ IMPÉRIALE)

ITEM	COMMENTAIRES	ACCEPTÉ	REJETÉ
1	Crosstube - W.O. 70645	✓	
1	Crosstube - W.O. 70644	✓	
1	Crosstube - W.O. 69360	✓	
1	Crosstube - W.O. 69361	✓	
8	Sleeve - W.O. 70858	✓	
1	Crosstube - W.O. 69105	✓	
1	Crosstube - W.O. 68521	✓	
1	Crosstube - W.O. 61771	✓	
1	Crosstube - W.O. 71035	✓	
1	Crosstube - W.O. 71036	✓	

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. n'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.

SIGNATURES

REPRÉSENTANT: Ian Titley
TECHNICIEN (SIGNATURE): [Signature]
NOM (MOULÉ): ERIC [Signature]
ONGC NIVEAU: II SNT NIVEAU: [Signature]
ONGC N° REGISTRATION: 10780
FTJ#: 003577
RAPPORT RÉVISÉ PAR: [Signature]
NOM: [Signature] INITIALES: [Signature]
2nd TECHNICIEN: [Signature]
ONGC NIVEAU: [Signature] SNT NIVEAU: [Signature]
ONGC N° REGISTRATION: [Signature]